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vey. The insinuation that the proposal to pay for the Arkansas reports could have had an improper motive may be set aside as unworthy of his own standing and mine. But I deny his charge that the survey is an undemocratic organization which abuses its power to the disadvantage of state surveys or of individual geologists. It encourages the organization of state surveys and seeks to co-operate with them in all practicable ways. It endeavors to maintain cordial cooperative relations with all working and teaching geologists, and welcomes all practical suggestions which may lead to a closer touch with them. That its attitude in these relations is necessarily controlled by the obligations of a national bureau to the people has already been said.

The last quarter of a century has been one of extraordinary development in geology. The leaders in this progress have been members of the United States Survey, and by virtue of their services it has had a dominant influence in the development of methods and of knowledge. To serve on its staff, in whatever capacity he is qualified by experience to fill, is no discredit to any geologist, nor is it a reflection on any geologist, however able and honored, that the work which he did a decade or two ago should require revision and should be revised according to the latest standards of topographic and geologic skill by the specially trained members of the national survey's permanent staff.

CHARLES D. WALCOTT.

A NEW VARIETY OF HONORARY PH.D.

WHAT constitutes an acceptable thesis for a Ph.D. degree is a problem which at some time has engaged the attention probably of every department and surely of every graduate faculty in our real universities. Of course it matters little to those institutions which still continue, in defiance of the best opinion and practise both here and abroad to grant the degree *honoris causa* or as a reward for the completion of a set time or of a specific series of courses. But it was a matter of astonishment to learn that graduate schools with higher ideals are given to accepting as theses

publications which have no evident relation to themselves, if indeed these papers reflect in any way the influence of the degree-granting institution. Within the past two years and at two different universities of good standing in the country, I have asked by chance what the work of a newly introduced doctor had been and was shown in each case a voluminous government document. Careful examination not only demonstrated that the publication was everywhere attributed to the direction and support of the particular division, the name of which appeared prominently printed on the cover and title pages, but also failed to disclose anywhere in the text the most obscure reference to the institution which had crowned the writer with the coveted laurel. Perhaps it is wrong to question the procedure, but the student had not been actually in residence for more than a brief period 'because you know,' the professor in charge naïvely remarked, 'he could not find the material or the literature for that work here, and then, too, the bureau paid all the expenses of the work.' One could not help wondering what part in the work the aforesaid professor had played when he had evidently not even assigned the topic for investigation.

But the climax appeared in a communication which one of my own colleagues received the other day. A long-time student and good friend of his had left his work for the doctorate partly finished to take a government position in the national capital, and after some time there wrote regarding his still unfinished thesis, "Unless some arrangements can be made by which the university will accept, as has been done in recent instances, and as is done by other universities, an official publication as fulfilling the thesis requirements, I shall have to abandon the plan of taking my degree from _____ and try another institution." The cordial relations existing between the two parties preclude any thought that an intellectual hold-up was attempted; it was merely the frank statement of the facts as the younger man in his official intercourse had found them. If the plan is recognized as feasible in official circles, as this and other circumstantial evidence would

serve to show is the case, then what of it from the university standpoint? No one would question that many government publications are abundantly worthy of the honor, but consider first the usually composite authorship which makes it exceedingly difficult to attribute to any single individual his due share of the work or to stamp it in any sense as research on his part; add to this the full financial and legal responsibility of the particular government bureau for the character and scope of this piece of investigation. Consider further the absolute lack of control on the part of the university over the correctness of the results reached, together with the omission of even its name from the text of the paper, and it is hard to say wherein this procedure differs from granting the degree purely *honoris causa*. After all, there are many men in actual work to-day who achieve results which *per se* would warrant granting them a doctorate. The best elements in university circles unite in agreeing that such a practise is dangerous, subversive of the best interests of graduate work and tending to break down the real university which we are now striving to build up in this country. This new tendency is equally disastrous and if seen in its true light is only another form of the ancient error against which university men should be on their guard.

X.

AN INTERMITTENT FLOWING WELL.

SOME months ago the city of Albany, Georgia, in order to get rid of an objectionable pond of water in the suburbs, attempted to drain it off underground by boring a well to a cavernous limestone, ninety or one hundred feet below the surface, when this rather singular phenomenon was discovered. Mr. Charles Tift, former city engineer, and a very accurate observer, gives the following description of the well:

A low place in the city requiring drainage and there being no natural outlet, it was decided to bore an eight-inch well to the cavernous limestone, by which method other ponds in the city had been drained. This special pond covered an area of about one half of an acre, the water having an average

depth of eighteen inches. The well was bored at the edge of the pond, a small dam having been previously made to keep back the water. At the depth of ninety feet, the drill dropped some six or eight feet into a cavity. The drill was then withdrawn and the dam removed. The water at once began to run very rapidly into the well, not completely filling the bore hole, however. In six and one half minutes the well filled and the water began to bubble and almost immediately thereafter the entire column of water was ejected with considerable violence to an estimated height of about thirty feet. When the ejecting force spent itself, the water again commenced to flow into the well, and the same phenomenon was again repeated.

For about an hour the ejections continued, but with gradually decreasing violence and at longer intervals, but ceased entirely only when the static head of the water in the pond became greatly reduced. This well is said to repeat its geyser-like action whenever a heavy rainfall fills the pond.

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'THE WIRELESS TELEGRAPH AND AURORA.'

SOME time ago I conceived the idea that the wireless telegraph might give assistance in unravelling the mystery of the aurora. The result was not exactly what I expected, and at the present time seems to add more complication to what was already complicated.

I have a record of observation by the wire on six nights during the last year, grouped in three, one and two, respectively, giving what are known as 'freak distances,' during spells of aurora, or the brilliant clear weather associated with aurora. During these three periods we received signals and read messages over abnormal ranges of 700 to 1,600 miles with an apparatus that ordinarily will not operate over more than 250 miles.

The apparatus could receive, but not send, and directly the aurora ceased or diminished, in at least four cases, the long distance messages also ceased to reach our wire.

My facilities are woefully inadequate, and I hope some weather service station with